

Appln. No. 09/319,439

Amendment dated Feb. 18, 2005

Reply to Office action of Nov. 18, 2005

Docket No. BOC-2000-0079 (214)

REMARKS/ARGUMENTS

These remarks are made in response to the Office Action of November 18, 2004 (Office Action). As this response is timely filed within the three-month statutory period, no fee is believed due.

In response to the Examiner's rejection of Claims 1-7 and 10-16 under 35 U.S.C. § 112, second paragraph, Applicants have amended Claims 1, 4, 5, 8, 9, 10, 13, and 14. Claims 4, 9, and 13 have also been amended in response to the Examiner's remarks in paragraphs 4 and 5 of the Office Action regarding an insufficient antecedent basis in each of the claims. The amendments are fully supported in the specification, as discussed herein. No new matter has been introduced by virtue of these amendments.

I. Applicants' Invention

Applicants have amended Claims 1, 4, 5, 8, 9, 10, 13, and 14 so as to particularly point out certain aspects of Applicants' invention, which pertains generally to electronic data processing. One such aspect is the workload transition that is performed by Applicants' invention if an overload condition arises during the processing of separate workload tasks. In the event of an overload condition – a condition in which processing resources are insufficient to handle a first workload task currently being or about to be processed – Applicants' invention reallocates system resources from processing the first workload task to processing an alternative, second workload task. As described in Applicants' specification at page 7, lines 13-18, the second workload constitutes a lighter workload in the sense that less system resources are needed for processing the workload tasks. The transition from the first to the second, lighter workload can return the system to an optimal operating state.

The scenario set out in Applicants' specification at page 10, line 9, through page 11, line 20, illustrates the transitioning from a heavy workload to a lighter one. In the scenario, at a point where 75% of the systems processing resources are already utilized (i.e., allocated to specific tasks), the processing of a first workload results in a request for effecting a

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particularly large database query. At that point in processing, however, the task can not be accommodated with the system's then-available resources. In response, a transition occurs that causes the systems resources to be reallocated from the first workload task to a second, lighter workload task. (See especially Applicants' specification, page 11, lines 7-20.)

If subsequently the first set of workload tasks – the "heavier" workload requiring relatively greater processing resources than the lighter one – still require processing, then when system resources later become available they are reallocated yet again and the processing of the first set of workload tasks is resumed. For example, a renewed request for processing the "heavy" workload may be received, in which event it is accommodated only when system resources become available for doing so. (Applicants specification, page 11, lines 15-20.)

Accordingly, in response to the Examiner's query in paragraph 3 of the Office Action, it is not that the first set of workload tasks might not require processing at all, but rather that when they do require processing, the processing is only done as adequate resources become available. It is this transitioning from heavy workloads to lighter ones when overload conditions are encountered that restores the system to an optimal operating condition. (Applicants' specification, p. 7, line 14-15.) It is in this context that the portion of the disclosure at page 12, lines 18-21, is to be read. More particularly, the heavier workload can be processed as normal after the unavailability of system resources has dictated that a transition be made to a lighter workload, but only when system resources adequate for the task become available, as explained by the scenario recounted above. (See Applicants' specification, p. 10, line 9 – p. 11, line 20.) Applicants' invention, moreover, permits another new and unrelated task to be processed in the interim if there are adequate resources for processing the new task even though not enough resources are available for processing heavier workload tasks. (Applicants' specification, p. 12, lines 19-20.)

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II. Applicants' Invention Is Not Rendered Obvious In View Of The Prior Art

In paragraphs 7-12, the Examiner has rejected claims 1, 2, 8-11 and 17 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,488,609 to Hluchyj, *et al.* (Hluchyj). In paragraphs 13-15, the Examiner has rejected claims 3 and 12 under 35 U.S.C. § 103(a) as being unpatentable over Hluchyj in view of U.S. Patent No. 5,838,968 to Culbert (Culbert). In paragraphs 16-21, the Examiner has rejected claims 4-7 and 13-17 under 35 U.S.C. § 103(a) as being unpatentable over Culbert in view of U.S. Patent Publication No. 2002/0040442 to Ishidera (Ishidera).

A. The Hluchyj Reference

Hluchyj is concerned with "controlling the load on selected links in a communication network." (Col. 3, lines 18-20; Abstract.) That is, Hluchyj is directed to managing connections within a connection-oriented communication network so that "existing connections share the burden of freeing up resources for accommodating new connections." (Abstract; Col. 4, lines 36-51.) Using information on the status of each link broadcast throughout the network, Hluchyj dynamically adjusts the rate of a connection in the network on a connection-by-connection basis. (Col. 4, line 60 – Col. 5, line 10.) To accomplish the task, Hluchyj marks links in the connection-oriented network based on control information in the link state, the in-call rate adjustment being based on negotiable Quality of Service (QoS) parameters.

Hluchyj is exclusively focused on "management of call-level resource allocation" for the sake of accommodating "new connections" among entities with a connection-oriented communication network. Hluchyj does not deal with the application server, as Applicants' invention does. The resources that Hluchyj deals with are call-level connection resources. Hluchyj does not address the allocation of application resources such as the central processing unit (CPU), disk, memory needed for processing workload tasks in an application server, as with Applicants' invention. Hluchyj is directed to a dynamic rate adjustment for

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controlling the rates of certain network connections. Hluchyj does not deal with application workloads and, accordingly, can not provide for an adjustment of such application workloads, as Applicants' invention does.

Applicants' invention allocates resources in an application server for controlling application workloads, providing for the determination of higher versus lighter workloads in a dynamic fashion so as to adjust the application work being done by an application server. None of these features are provided by Hluchyj, which is exclusively focused on network connections. Such network connections may link application servers, but their management suggests nothing about allocating resources within an application server. Specifically, the management of "loads" within a "connection-oriented communication network" does not teach or suggest detecting application server overloads. More particularly, the management of connection loads in a communication network does not teach or suggest how to allocate and reallocate system resources in an application server so as to more efficiently accomplish the processing of application server workload tasks.

It is well established that merely because a reference can be modified to cover a claimed invention, a modification does not render the claimed invention obvious unless the prior art suggests the desirability of such a modification. *See, e.g., In re Mills*, 916 F.2d 680 (Fed. Cir. 1990). Applicants respectfully note that the Examiner, at paragraph 8 of the Office Action, asserts that "it would have been obvious . . . to recognize that the dynamic rate adjustment such as the increase from the lower level to the higher level shows the step of allocating of the adequate resource as it becomes available." Applicants respectfully submit that this is only half of the required formulation for showing obviousness. It merely states what is essentially true regardless of the context, namely, that dynamically adjusting an allocation of system resources can improve a system's performance. If this is indeed a motivation for modifying Hluchyj, then what remains lacking is *how* to modify Hluchyj so as to achieve Applicants' invention.

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As already noted, Hluchyj addresses the allocation of connection resources in a connection-oriented network, but in no way concerns the application layer generally or application servers specifically. Applicants' respectfully maintain that there is nothing to demonstrate how to modify Hluchyj in order to achieve Applicants' invention. At paragraph 8 of the Office Action, the Examiner states that Hluchyj "discloses the source of each connection, whose rate is subject to dynamic adjustment," as well as "examining the path supporting the connection . . . such that if all the links along the path are unmarked, the rate of the connection is increased from [a] previously agreed level to the requested level, provided the previously agreed level is lower than the requested [level] and that the dynamic rate adjustment scheme may implemented based on available capacity." Applicants respectfully submit, though, this certainly is not Applicants' invention, and no modification makes it so.

Disclosing the "source of each connection" does not teach or suggest detecting an overload condition in an application server. Nor does examining "links along [a connection] path" to determine whether or not they are marked suggest anything about examining the CPU, disk, memory or other application server resources to determine whether the processing of workload tasks in the application server can be accomplished. Increasing a rate to a "requested level" if the "the previously agreed level" can be implemented with "available [network] capacity" suggests nothing about allocating application layer resources for processing workload tasks. That a request is made and that it is fulfilled if network resources are available, quite simply, does not suggest how to allocate and reallocate application server resources for overcoming an overload in the application server. Applicants respectfully submit, therefore, that Hluchyj does not render obvious any of independent Claims 1, 8, 9, or 10. Applicants further respectfully submit that, in as much as Claims 2 and 3 depend from Claim 1, and Claims 11 and 12 depend from Claim 10, while reciting additional elements, these claims, too, are not rendered obvious in view of Hluchyj.

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B. Hluchyj In View of Culbert

At paragraph 14 of the Office Action, the Examiner in addressing Claims 3 and 12 acknowledges that Hluchyj fails to disclose monitoring of system parameters relating to utilization of a CPU, disk, I/O, or memory. The Examiner asserts, however, that it would have been obvious to combine with Hluchyj the teaching of Culbert, which is directed to dynamic resource management across tasks in real-time operating systems. Culbert manages an arbitrary set of system resources and seeks to globally optimize resource allocation across system tasks in a dynamic fashion according to a system specified performance model. (Col. 3, lines 16-44.)

Specifically, Culbert is intended to enable the dynamic allocation of resources to a task being performed. This, however, is entirely distinct from dynamically changing the workload being performed by a particular task so as to consume less system resources, as taught by Applicants' invention. Culbert may take into account utilization of a CPU, disk, I/O, or memory, but it is directed to dynamically changing the amount of resources allocated to *the* task that is being executed on a system. Culbert does not provide dynamic determination of *which* task is to be given scarce system resources. Specifically, Culbert does not allocate or reallocate system resources among different tasks so that the lighter task is processed while the heavier task waits for available resources. Culbert, accordingly, can not allocate system resources among different tasks in order to overcome an overload condition. Culbert thus can not restore the system to an optimal operating state when a system encounters such an overload.

Culbert does not provide a mechanism for the transition from one workload to another in performing workload tasks. Instead, Culbert provides a mechanism for the amount of resources allocated for executing a particular task. This, again, is entirely distinct from Applicants' invention. Culbert is focused on degradation of tasks as opposed to modification of tasks being performed. As detailed at Col. 9 lines 15-23 and 40-46, Culbert prioritizes

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tasks, degrading or heightening their performance by increasing or decreasing resources allocated to those tasks.

Applicants' invention, by contrast, modifies workload tasks being performed based on the overall status of the system. Applicants' invention, unlike Culbert, results in a categorization of workloads so as to avoid only workloads that will heighten specific resource constraints. Specifically, preventing continued system overload conditions by switching to lighter workloads, according to Applicants' invention, is entirely distinct from Culbert in general and especially in regard to e-business systems. Accordingly, Applicants respectfully maintain that even by combining Culbert and Hluchyj, the combination fails to render Applicants' invention obvious and that there is no basis for rejecting Claims 3 and 12.

C. Culbert In View of Ishidera

Regarding independent Claims 4, 13, and 17, the Examiner asserts at paragraph 16 that each is rendered obvious by Culbert in view of Ishidera. Ishidera is directed to a software processing apparatus. It includes an operating-environment determining unit that determines whether an operating environment requires power saving or not at the time of executing a process such as an animated display process. Ishidera also includes a switching unit that performs a simplified light-load process by making a portion of the functions of software valid in the environment that requires power saving, and executes a heavy-load process by which all of the functions of the software are valid in the environment which does not require power saving.

In contrast to Applicants' invention, however, Ishidera determines whether to alter the behavior of a program/task solely on resource consumption as opposed to business application priority. In Applicants' invention, a low priority alternate workload can be assigned to a particular application workload, making it operate in a somewhat less functional capacity during a period of excess load. Then, as the business needs dictate, the priority can be raised, thereby normalizing the behavior of the application given the

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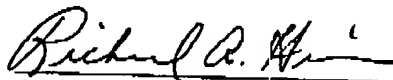
same excess load condition. Another difference is that Applicants' invention determines a status as opposed to merely being informed of the status. This provides an enhanced range of opportunities and greater possibilities for altering processing behavior, not just load. Applicants respectfully submit, therefore, that Culbert in view of Ishidera similarly fails to render Applicants' invention obvious and does not provide a basis for rejecting independent Claims 4, 13 and 17. Similarly, since dependant Claims 5-7 and 14-16 depend, respectively on independent Claims 4 and 13 while reciting yet additional elements, these claims are also not rendered obvious by Culbert in view of Ishidera.

CONCLUSION

Applicants believe that this application is now in full condition for allowance, which action is respectfully requested. Applicants request that the Examiner call the undersigned if clarification is needed on any matter within this Amendment, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,

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Gregory A. Nelson, Registration No. 30,577

Richard A. Hinson, Registration No. 47,652

Brian K. Buchheit, Registration No. 52,667

AKERMAN SENTERFITT

Customer No. 40987

Post Office Box 3188

West Palm Beach, FL 33402-3188

Telephone: (561) 653-5000